

BARG GENERAL MEETING HELD JULY 31st 1987.

MEETING OPENED by President Ron at 7.50pm with 22 members in attendance and one visitor VK3 BGI.

APOLOGIES VK3 KIT, CUH, CFH, VU, KGL, NIZ, SE.

MINUTES of previous meeting as circulated were confirmed. CCB/KQF.

CORRESPONDENCE Letter from Dick VU re proposed UHF link with Channel 7.

TREASURERS REPORT General account \$57.53. VS\$L account \$1567.79.

Account for payment/Room Hire \$72.00. PUJ/KQQ.

QSL BUREAU No cards received. This makes 3 months without any receipts.

AWARDS Maurie XEX had applications for 3 Goldrush, 3 DX Widows and 3 W.Zone.

CLUB NET Co-ordinatort Reg CAZ would like more members to join in the Net.

EDUCATION Ian AXH reported that one student who has been tutored by himself and Kevin WN would be sitting the August examination. He failed however to mention the demonstration and talk that he gave to the inmates of Kellaston Home for the Blind assisted by Greg DIE. Reports are that it was very well received. Thanks Ian & Greg.

NEWSLETTER More material is required to keep the Newsletter interesting and informative. PLEASE HELP. Send copy to Ron XOA.

GENERAL BUSINESS. The trip to the Dept of Meteorology has been cancelled owing to lack of numbers.

MOTION. moved WN seconded PUJ that Dick AEX be re-imbursed for expences incurred in representing the Club at WICEN Meeting. Carried.

moved KQF seconded PUW that Club agree to assist in installation of UHF link to Channel 7, subject to further information at next meeting. Motion was carried.

JOTA. weekend will be 17th & 18th of October at Mt. Beckworth Forest area and Members are in favour of participating, operators will be required.

CLUB SUBSCRIPTIONS are now due. \$10.00 Full member. \$5.00 students penshioner.

HAMVENTION Kevin WN would like some suggestions for the Raffle prize.

PACKET RADIO Murray AAI showed the Members the TNC and Modem for the new Packet Repeater.

MEETING CLOSED at 8.40pm and Kevin WN then gave a demondtration of Circuit Board making. Thanks Kevin.

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73s Jim CFB.

NEXT BARG MEETING is on Friday 28th August at 7.30pm. Education Centre.

COMMITTEE MEETING is on Wednesday 16th September 7.30pm. Education Centre.

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? WHEN IS A ZENER DIODE NOT A ZENER DIODE?

When a reverse-bias is applied to a P-N junction this potential assists the intrinsic diffusion of carriers which resulted in the formation of a depletion layer and so the width of the depletion layer increases. The potential causes conduction across the junction to cease and so the potential applied will appear across the high resistance of the junction. This region close to the junction will, in effect be almost "intrinsic semi-conductor material" since the reverse-bias will have removed all carriers except for the minority carriers. These minority carriers will not increase greatly in number due to the increased potential applied since they are in effect a "saturated" current. The effect of widening the depletion layer does to some extent compensate for the increase in electrical field strength applied but does not fully compensate for it.

Consequently if the reverse potential is increased sufficiently a critical point is reached where the junction "breaks down" and when this point is reached the resistivity of the junction falls rapidly and the current likewise increases rapidly from its low saturation value.

There are two main mechanisms in this breakdown process which does not necessarily cause permanent damage to the device if it has been devised so as to make use of this special phenomenon. The first of these mechanisms is called Field Emission or Zener breakdown after its first postulant and the second effect is avalanche breakdown.

Field Emission is usually the mechanism responsible for the breakdown of very heavily-doped P-N junctions which generally enter breakdown at reverse-bias's of less than 6 volts. Due to the heavy doping concentration in such a junction the depletion layer is very narrow even under reverse-bias conditions and consequently the electric field across the junction can be very high, of the order of 10^6 volts/cm. An electric field of this magnitude is strong enough to literally rip an electron from its bonds producing both a hole and an electron which can now act as carriers. Thus the field itself can produce carriers. These are swept rapidly away by the applied electric field and replaced by another newly ruptured bond and this causes the current to increase rapidly.

Avalanche breakdown is usually responsible for the breakdown of lightly doped junctions, such junctions generally breaking down at potentials in excess of 6 volts. From its name it can be seen as a "snowball" effect where a minority carrier drifting across the junction due to the applied electric field will develop sufficient momentum to knock loose an electron from its bond by collision. This in effect is "ionization by

collision" and involves a net gain since one collision by a carrier can produce two carriers, one hole and one electron.

Again the current rises rapidly from its "saturation value" when the field due to the applied voltage is high enough.

Virtually any semi-conductor diode will perform after a fashion the function of a breakdown diode to give them their proper name but there is a tendency for breakdown to occur unevenly and in a localised manner at some specific point on the junction thus tending to concentrate the breakdown current in a small area with the risk of localised overheating and destruction of the junction.

The nominal values of breakdown voltage is a somewhat arbitrary figure because the voltage drop of a given device is not entirely independent of current level and in addition it tends to be temperature-dependent. With very low voltage devices there is a problem in that the breakdown point is not a sharp knee in the characteristic but more a gradual current increase. It is normal therefore for the nominal voltage of a breakdown diode to be quoted for a specific current level and temperature.

Temperature co-efficient is of some importance where the device may be exposed to wide variations in temperature. The two main mechanisms involved in P-N junction breakdown have opposing temperature co-efficients. The Zener or field effect responsible for low voltage breakdown, i.e. less than 6 volts has a Negative Temperature Co-efficient, e.g. voltage falls with rising temperature. Conversely Avalanche breakdown, as in high voltage devices, say above 10 volts has a Positive temperature Co-efficient. A typical figure in both cases is $5\text{mV}/^{\circ}\text{C}$.

Devices which operate at around the 6 Volt region tend to be equally affected by both mechanisms and hence diodes of close to this value of breakdown voltage have very low values of temperature co-efficient. It is not uncommon to see strings of 5 or 6 volt diodes in series making up a higher value of reference voltage to take advantage of this fact.

So referring to the title I suppose it is only a Zener diode if its breakdown voltage is less than about 6 Volts, but I don't suppose we will change the habits of numerous years of incorrect labelling of the devices.

87/08 4

Victorian Digital Repeaters - Last Revision 20-July-87**MELBOURNE PACKET RADIO GROUP**

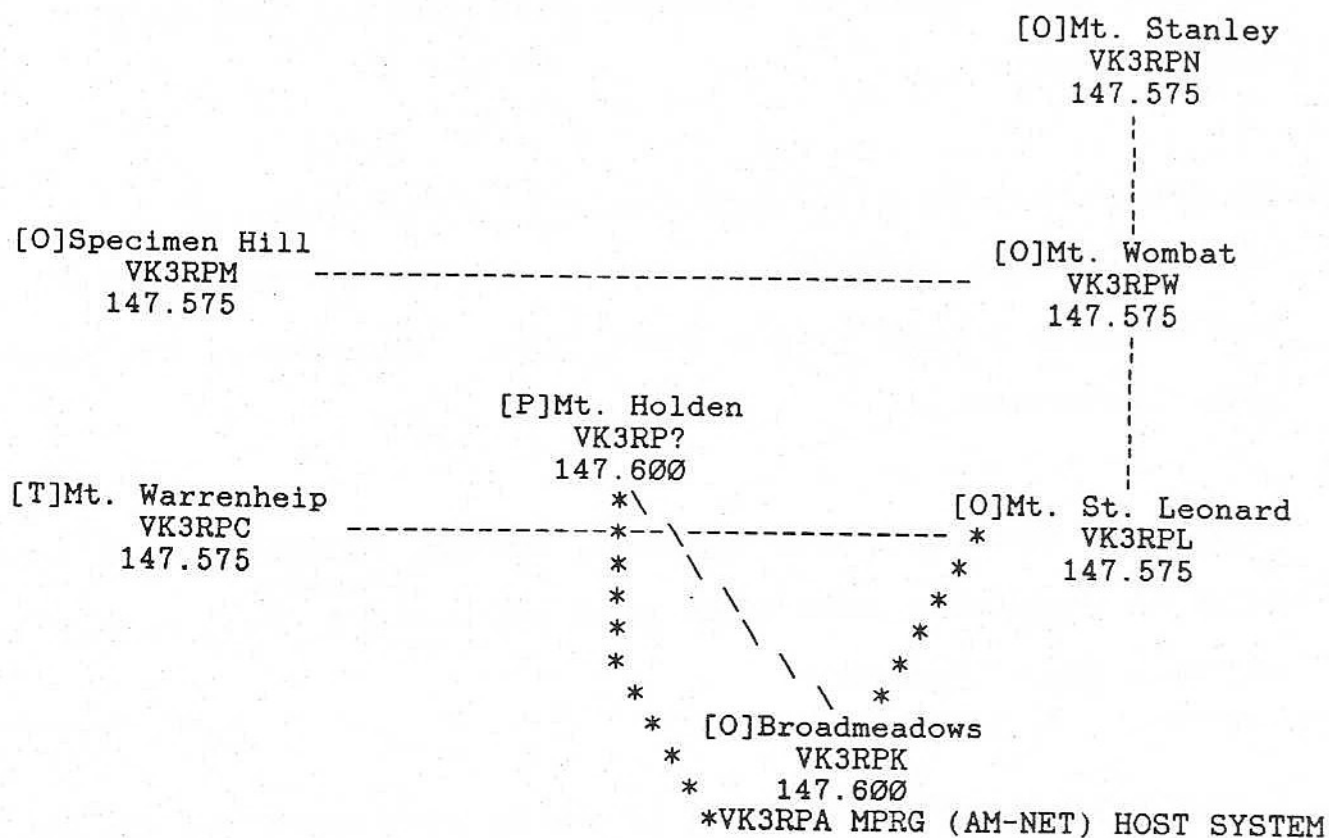
P.O. Box 299 St. Albans VICTORIA AUSTRALIA 3021

AREA	CALL	CHAN	PWR	HEIGHT	SITE	H/W	S/W	SP	STA
MELBOURNE	(2) VK3RPA	7575	25	83	ST. ALBANS	VTNC+	SAX.25	WIAV	O
	(3) VK3RPA	7600	25	83	ST. ALBANS				O
	(4) VK3RPA	9200	25	83	ST. ALBANS				P
BALLARAT	VK3RPC	7575	25	741	MT. WARRENHEIP	VTNC+	RPT2.3	WIAV	T
MELBOURNE	VK3RPK	7600	25	130	BROADMEADOWS	VTNC+	RPT2.3	WIAV	O
MELBOURNE	VK3RPL	7575	25	1028	MT. ST. LEONARD	VTNC+	RPT2.3	WIAV	O
BENDIGO	VK3RPM	7575	25	240	SPECIMEN HILL	VTNC+	RPT2.3	WIAV	O
WODONGA	(6) VK3RPN	7575	25	1051	MT. STANLEY	VTNC+	RPT2.3	WIAV	O
MELBOURNE	(5) VK3RP?	4800	25	320	MT. HOLDEN				P
	(2) VK3RP?	7575	25	320	MT. HOLDEN				P
	(3) VK3RP?	7600	25	320	MT. HOLDEN				P
SHEPPARTON	VK3RPW	7575	25	799	MT. WOMBAT	T220	COSI	WIAV	O

Notes:-

- (1) All the above DR's are equipped with 15 second time-out timers.
- (2) Secondary, Standby channel (used for packet demo's etc).
- (3) Primary operational channel.
- (4) Future planned RTTY gateway to VHF packet network.
- (5) Future operational once uhf linking completed to VK3RPA and VK3RPL.
- (6) Currently down under repair.
- (7) Explanation of Hardware (H/W) symbols.
T220 - Pac-Comm TNC-220 Dual Port TNC.
VTNC1 - Vancouver TNC1.
VTNC+ - Vancouver TNC+.
- (8) Explanation of Software (S/W).
COSI - N2WX Level 3 Packet Switch Software.
RPT2.3 - Latest release of SDCG DR code for TNC1 + TNC+.
SAX.25 - Sydney Amateur Digital Communications Group AX.25.
- (9) Explanation of Sponsor (SP).
WIAV - WIA Victorian Division.
- (10) Explanation of Status Codes.
P - Currently Planned.
T - Testing.
O - Operational at final site.

The network map is as follows:-



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< - | \ > 2M in band virtual connections.
< *      > Proposed 70cm full duplex link.
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Peter Hallgarten
VK3AVE
PRESIDENT
Melbourne Packet Radio Group

87/08 6

PRESIDENT'S COMMENT

Since the A.G.M. the Committee have met twice to formulate ideas for the coming year. A variety of exciting ideas have emerged from these meetings. Several of them will be held over until the weather improves and the days become warmer.

An event that is fast approaching is the hamvention. As this is a club project, do not be afraid of jumping in and lending a hand to the Committee. Remember, many hands make light work.

Thanks to our Publicity Officer, Gordon VK3PUW, the Group will be receiving some very good publicity ^{INCLUDING} A spot at the Orpheus Radio Museum.

A visit to the Fire Station is being arranged, hopefully for October, as I need to know numbers to pass onto the Duty Officer, could you please let me know if you will be attending, at the next meeting.

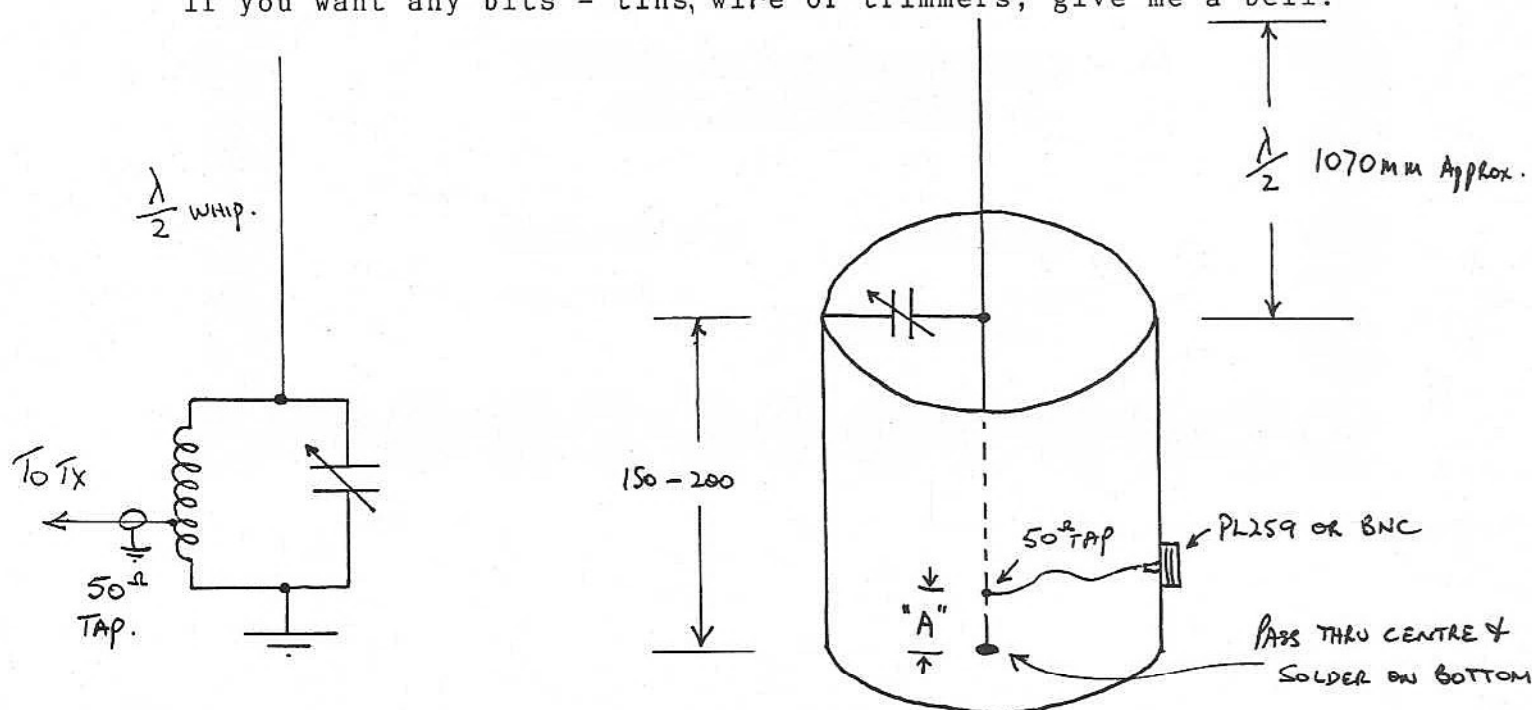
Our Guest Speaker at the next meeting will be Ian Channing, Chief Radiologist at the Base Hospital, who will talk on the operation of the modern X-Ray machine.

Don't forget, subscriptions are now due and payable to the Treasurer, Harry VK3KGL.

87/08 7

I WONDER WHAT I CAN USE THIS FOR - NOT ANOTHER ANTENNA

Well if you got some of those beaut trimmers at our last club meeting, which Dick AEX kindly brought along, here is an idea for them. By the way, they are 0-140pf. Well lets make a "can-tenna for 2 metres". We know that for a half wave antenna we won't need any radials so grab a piece of galvanised fencing wire or one eighth brass rod 1070mm long. Also a coffee, paint, baby milk powder or powdered milk tin about 130mm diameter and about 150mm high. We will need a connector, BNC or PL259 as well. The sketch at the left shows the theory and at the right your finished antenna. To tune it, connect in series, a good V.H.F SWR meter and adjust the trimmer for a dip and then adjust the tap "A" for min. S.W.R re-checking the trimmer and also the length of the antenna for max. field strength. If you want any bits - tins, wire or trimmers, give me a bell.



Best of luck, see you on 2 metres.

73's

Bob VK3BNC

FOR SALE

Emtron SWR/Power meter EP200 (new)	\$70.00
HK 708 Morse Key	\$12.00
Willis Air Coil suitable for an A.T.U.	\$ 7.50
6146B (NEC) New	\$21.00
Dummy Load 50 OHM 50W	\$12.00
Transmission Monitor 160-10M Home Brew	\$20.00

*For the above items ring Arthur VK3LJ 689520

Novice handbooks. now in stock, call Brian VK3KQB

FOR GOOD HOMES

Model 15 Teletype & Trolly. See Harry VK3KGL.
Low Band S.T.C. base station suitable for 6M operation. Contact
Brian VK3KQB.

87/08 8

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THE SPOTLIGHT IS ON!

Venture Video

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